Global land project

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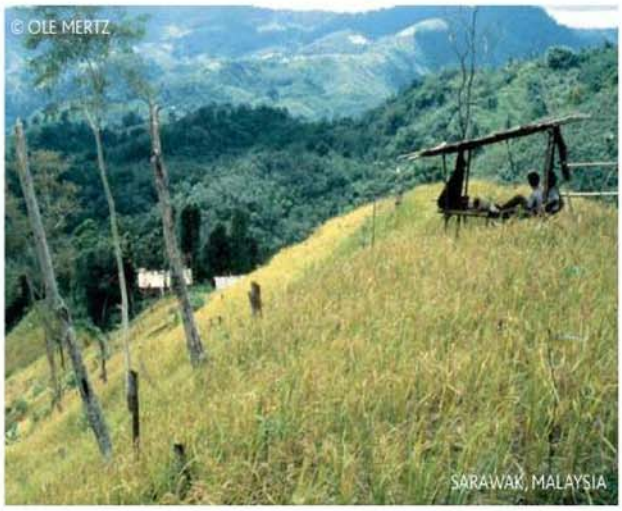
In response to the growing need for land system information, a collaborative agenda known as the Global Land Project aims to coordinate efforts in this field. SSC Chair, **Professor Anette Reenberg**, discusses the goals of the project and how they plan to promote a new integrated paradigm

Could you explain the overall aims and objectives of Global Land Project (GLP)? What prompted the original development of the initiative?

The Global Land Project (GLP) was initiated in 2005 as a joint research agenda of the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimension Programme on Global Environmental Change (IHDP) to improve the understanding of land system dynamics in the context of the larger Earth System. It is part of the broader effort to understand how human-environment interactions have affected, and may in turn affect, the sustainability of the terrestrial biosphere. The ambition of GLP is to pay a significant role in improving the understanding the dynamics and vulnerability of regional and global-scale land systems, as well as promoting scientific synergy across international research communities.

The GLP Science Plan emphasises changes in the coupled socio-environmental system, and builds upon the extensive heritage of previous IGBP and IHDP research efforts, particularly from the IGBP project on Global Change and Terrestrial Ecosystems (GCTE) and from the joint IGBP-IHDP project on Land Use and Land Cover Change (LUCC).

The ambition of GLP is to promote a new integrated paradigm focused on two main conceptual aspects of the coupled system: firstly, it deals with the interface between people, biota, and natural resources of terrestrial systems, and secondly, it combines detailed regional studies with a global, comparative perspective. GLP takes as its points of departure ecosystem services and decision making for the terrestrial environment. These topics are at the interface of the societal and the environmental domains, and serve as conceptual lenses for a highly interdisciplinary research plan.



In this respect, it has been interesting to follow the ICSU Earth System Visioning process, which was established to engage the scientific community, to explore options, and propose implementation steps for a holistic strategy on Earth System research, which has led to the identification of the 'Grand Challenges for Earth System Science for Global Sustainability' in 2010. Overall, the ICSU Grand Challenges and GLP share the same conceptual and analytical framework of the 'coupled human-environmental system'.

Available land is presently under a huge strain to support our planet and these pressures are increasing rather than diminishing. The importance of understanding the human-environment interactions related to land and its use has never been so valuable. What approaches is the GLP taking to meet this challenge?

The GLP research community contributes with a range of insights which in combination can contribute to enhanced insight into the complex interrelation between local processes and decisions and their implications for the sustainability at the planetary scale. This includes improvement of global data on land use, biomass production and appropriation, local-to-global scale modelling of land use, assessment of ecosystems services as related to land use, research to improve insight in land use change processes and investigations of the accelerating role of teleconnections for global land use change processes, to mention a few.

Can you outline the scientific, financial and social limitations of existing systems, and the methods by which GLP seeks to combat them?

The obvious value of international networks like GLP is its ambition of bringing together leading international scholars, which can inspire each other and occasionally challenge received wisdom or provide inspiration for novel perspectives. The persisting problem is funding – networks need funding for coordination – and this seems to be an increasing problem to recover from the contemporary funding environment.

Can you elaborate on what is included under the GLP's 'land-centric' focus? Do you tackle groundwater stocks and disaster issues such as earthquakes and landslides? By what means are the interlinkages between climate change and natural disasters assessed for example?

This means that the conceptual framework of GLP is centred on the issue of land use and land management. We try to understand how land use dynamics are enabled and constrained by (and interact with) the socioeconomic and biophysical environment – so depending on the problems addressed, the answer to your question could be positive. Adaptation to climate change, for example, will be a very important issue to address when we look at trajectories and pathways of change in land use systems.

Population pressure, climate change and globalisation are several of the difficulties that we face as a global community. How are each of these factors affecting land and land use?

This is – I believe – a key issue for the GLP research. These multiple exposures come as a package. They amplify the challenges for the humanity. Almost all cultivable land is currently in use for agriculture. The global population is expected to increase to 9 billion by 2050 (from the current 7 billion). But more importantly, increase in economic wealth leads to changing consumption patterns. In fact, it is estimated that the increasing demand for animal proteins in emerging economies like China and India will increase the request for agricultural land several times more than the population increase. Globalisation implies increasing interconnectedness across the planet, and a radical disconnection between peoples' localisation and the pressure on land. For example, the accelerated growth of soybean fields in Brazil and Argentina is, to a large extent, driven by demands for fodder in overseas pig industries.

As a collaborative project between the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme (IHDP), how is work coordinated? Does each programme independently conduct research and compare its findings or is research conducted together?

IGBP and IHDP should rather be perceived at another layer of the hierarchical structure of research programmes that GLP belongs to. The core projects (such as GLP) are in fact the basis of the global environment change programmes. IHDP and IGBP are the overarching bodies. GLP has a special position in as much as we have a broad agenda which cuts across social and biophysical sciences, and hence potentially benefit from guidance from both communities.

Do you believe there is sufficient funding to tackle issues of land use? By whom are you funded?

My answer is no. It has always been specifically difficult to get funding for research of an interdisciplinary nature. I will, however, remind you that all research activities conducted in the GLP context are projects that have their own funding – and then seek collaboration with the GLP-community. In rare cases, we have provided help and inspiration to build the proposals. Another concern is the funding for the project office. For the first six years we have received generous funding from the University of Copenhagen. This expires by the end of 2011 and the GLP-IPO will move to Brazil where INPE has kindly offered to host the administration.

The transfer of the GLP-IPO will certainly be a major challenge, but I am confident that it will be successful and timely. GLP will have a new leadership (Professor Peter Verburg) who together with a very competent scientific board will be able to capitalise on the first six years' work and the inspiration from a successful GLP-conference last year in the synthesis phase.

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